

## **2013 Project Abstract**

For the Period Ending June 30, 2016

**PROJECT TITLE:** Updating National Wetland Inventory for Minnesota - Phase 4

**PROJECT MANAGER:** Steve Kloiber

**AFFILIATION:** Minnesota DNR

**MAILING ADDRESS:** 500 Lafayette Road, Box 25

**CITY/STATE/ZIP:** St. Paul, MN 55155

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**E-MAIL:** [steve.kloiber@state.mn.us](mailto:steve.kloiber@state.mn.us)

**WEBSITE:** [http://www.dnr.state.mn.us/eco/wetlands/nwi\\_proj.htm](http://www.dnr.state.mn.us/eco/wetlands/nwi_proj.htm)

**FUNDING SOURCE:** Environment and Natural Resources Trust Fund

**LEGAL CITATION:** M.L. 2013, Chp. 52, Sec. 2, Subd. 03d

**APPROPRIATION AMOUNT:** \$1,000,000

### **Overall Project Outcomes and Results**

Updating the National Wetland Inventory (NWI) is a key component of the State's strategy to ensure healthy wetlands and clean water for Minnesota. This effort is a multi-agency collaborative under leadership of the Minnesota Department of Natural Resources. These data are intended to replace the original 1980s NWI data. The NWI data provide a baseline for assessing the effectiveness of wetland policies and management actions. These data are used at all levels of government, as well as by private industry and non-profit organizations for wetland regulation and management, land use, conservation planning, environmental impact assessment, and natural resource inventories. The update project is being conducted in phases with data released for each region as it is finalized.

In this fourth phase of the overall effort, the DNR updated wetland inventory maps for 14,700 square miles in northeast Minnesota covering all of Lake, Cook, and St. Louis counties as well as portions of Carlton and Koochiching counties. The overall accuracy for wetland identification is 86%.

The updated NWI data was created in accordance with federal wetland mapping guidance. This update used spring aerial imagery acquired in 2009, summer imagery acquired in 2013, and lidar elevation data as well as other ancillary data. Quality assurance of the data included visual inspection, automated checks for attribute validity and consistency, as well as a formal accuracy assessment based on an independent field data. Further details on the methods employed can be found in the technical procedures document for this project located on the project website ([http://www.dnr.state.mn.us/eco/wetlands/nwi\\_proj.html](http://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html)).

### **Project Results Use and Dissemination**

All wetland map data and aerial imagery are available free of charge to the public. The data have been made available through the Minnesota Geospatial Commons (<https://gisdata.mn.gov/>) as well as through an online wetland viewer (<http://www.dnr.state.mn.us/eco/wetlands/map.html>). A copy of the data has also been provided to the US Fish and Wildlife Service for inclusion in the national wetland database.

Use of the NWI data is being promoted through a variety of channels. The DNR has given presentations about the NWI data at both the Minnesota Water Resources Conference and the Minnesota GIS/LIS Conference. The DNR and MnGeo have presented at the Minnesota GIS/LIS Conference regarding the availability of the spring aerial imagery. A press release has also been drafted for an expected September release. A peer-reviewed journal article was published in the journal *Wetlands* based on the work from the previous NWI project phase and a book chapter has been prepared for an upcoming publication on wetland assessment.



# Environment and Natural Resources Trust Fund (ENRTF)

## M.L. 2013 Work Final Plan

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**Date of Status Update Report:** August 31, 2016

**Final Report**

**Date of Work Plan Approval:** June 25, 2013

**Project Completion Date:** June 30, 2016

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**PROJECT TITLE:** Updating the National Wetland Inventory for Minnesota - Phase 4

**Project Manager:** Steve Kloiber

**Affiliation:** Minnesota DNR

**Mailing Address:** 500 Lafayette Road North, Box 25

**City/State/Zip Code:** St. Paul, MN 55155-4025

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**Email Address:** [steve.kloiber@state.mn.us](mailto:steve.kloiber@state.mn.us)

**Web Address:** [http://www.dnr.state.mn.us/eco/wetlands/nwi\\_proj.html](http://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html)

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**Location:** Lake, Cook, and St. Louis Counties

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**Total ENRTF Project Budget:**

**ENRTF Appropriation:** \$1,000,000

**Amount Spent:** \$ 978,586

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**Balance:** \$ 21,414

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**Legal Citation:** M.L. 2013, Chp. 52, Sec. 2, Subd. 03d

**Appropriation Language:**

\$1,000,000 the first year is from the trust fund to the commissioner of natural resources to continue the update and enhancement of wetland inventory maps for Minnesota. This appropriation is available until June 30, 2016, by which time the project must be completed and final products delivered.

## I. PROJECT TITLE: Updating the National Wetland Inventory for Minnesota - Phase 4

### II. PROJECT STATEMENT:

Over the past 100 years, about half of Minnesota's original 22 million acres of wetlands have been drained or filled. Some regions of the State have lost more than 90 percent of their original wetlands. Urban development, agricultural drainage, mining, road construction, and utility projects result in additional losses each year (attached figure). The function and quality of remaining wetlands are often impaired. Updating the NWI is a key component of the State's strategy to monitor and assess wetlands in support of efforts to assure healthy wetlands and clean water for Minnesota.

- NWI is the only comprehensive inventory of wetlands for Minnesota. To protect wetlands, we need to know how many wetland acres we have and where they are. We can't manage what we don't measure. Unfortunately, the current NWI is inaccurate in many places because it is 25-30 years out-of-date and some of the original imagery used was relatively coarse scale.
- NWI is an important screening tool for land use planning and for identifying potential wetland impacts. State, regional and local agencies use the NWI for making land use decisions, including planning for transportation and utility services. Wetland programs such as Minnesota's Wetland Conservation Act and the US Army Corps' Clean Water Act Permit Program rely on the NWI as the initial resource for identifying potential impacts of proposed projects. Having accurate maps upfront prevents problems later on; saving time and money for permit applicants and wetland program managers as well as preventing wetland impacts.
- NWI is useful for strategic wetland restoration planning. Funds for wetland restoration are limited; therefore, it is important to get the most benefit possible for our restoration dollars. Wetland maps provide useful information for strategic wetland restoration planning. The NWI includes information about partly drained and ditched wetlands that may be potential wetland restoration opportunities. In addition, the updated NWI will provide enhanced attributes to support assessment of wetland function. The updated and enhanced NWI will also help target wetland restoration in a way that complements the functions and values of existing wetlands.

This is the fourth phase of a six-phase project to update the National Wetland Inventory (NWI) maps for Minnesota using modern, high-resolution imagery and elevation data. This project phase updates NWI maps for 1,097 USGS quarter quadrangles for northeastern Minnesota including all of Lake, Cook, and St. Louis Counties and portions of Carlton and Koochiching Counties. The data required for updating the NWI maps in this proposal was already acquired through a previously funded project phase. High-resolution elevation data were also acquired through a separate project. Wetland maps and aerial imagery will be produced by contractors under the supervision of the DNR. All wetland map data and aerial imagery will be available free of charge to the public.

### III. PROJECT STATUS UPDATES:

#### Project Status as of January 31, 2014:

The DNR published a request for proposals to conduct the update of the NWI for northeast Minnesota in July. The contractor selected for this work was Ducks Unlimited. Their bid came in under budget, allowing us to expand the scope of the mapping area from 7,185 square-miles to 13,778 square miles. Subsequently, we developed and executed a contract for this work on September 30, 2013. We also developed a service level agreement (SLA) with the DNR Resource Assessment Program (DNR-RAP) to provide project support including data preprocessing, field work, and quality control review.

An initial joint field reconnaissance was conducted by Ducks Unlimited and DNR-RAP in the first week of October. A project kick-off meeting was held with the contractor and the technical advisory committee on October 9th. The Ducks Unlimited Team (DU and subcontractor Equinox Analytics) also had an initial technical workshop meeting on November 13-16, 2013.

All of the input data for the project area have been compiled and transmitted to DU. Automated scripts have been developed by DNR-RAP for the preprocessing of the lidar data and the results of this have been provided to the DU Team for testing on three pilot watersheds; Pike River, Upper Little Fork River, and Sturgeon River.

The development on the watershed-scale segmentation and classification process is complete and the draft automated analysis data and is currently being worked on by the photo-interpretation team.

Another meeting was held in December to discuss the potential for project enhancements based upon a tentative offer of additional financial support from the Coastal Zone Program. We are continuing to refine the potential scope and cost estimates for these potential enhancements.

**Project Status as of July 31, 2014:**

DU has been reconfiguring the imagery data by mosaicking the imagery into watershed-based work areas. This process is done to reduce the overall number of seamlines required between project work areas. The operating assumption is that watershed boundaries do not usually cut across wetlands. There is also some benefit from the fact that some of the lidar derivatives, like the compound topographic index, require computation on a watershed basis as well. This work is about 70% complete. Also river features within each watershed work area are being manually delineated as a precursor to the image segmentation process. This work is about 33% complete. DNR-RAP has generated the input data layer stacks for about 35% of the project area. The image segmentation process has undergone a number of refinements. Segmentation is complete for 15% of the project area and draft NWI maps have been developed for three watersheds (about 4% of the project area).

**Amendment Request (8/14/14) Approved (8/18/14):**

The purpose of this amendment request is to shift \$1,555 from the budget line for equipment tools and supplies to the professional technical contract for wetland mapping services. The intention is to provide funding for a joint workshop for the project team and vendors to discuss strategies for ensuring consistency and accuracy of the hydrogeomorphic classification of wetlands. The workshop will be held in the Twin Cities over a two-day period. The funding shift is needed to cover the costs associated with having two staff members from Ducks Unlimited participate in the workshop (time and travel costs). The additional \$1,555 will be added to the line item for wetland mapping services which has \$1,645 currently unencumbered. The total cost for the contract amendment is \$3,200.

**Project Status as of January 31, 2015:**

Data pre-processing is proceeding with watershed imagery mosaics created for 67 out of 80 watershed tiles in the project area (83%). River segments have been manually digitized for 50 out of 80 watersheds (62%). The DNR Resource Assessment Program has delivered pre-processed data layer stacks for 79 out of 80 watersheds (99%). The image segmentation process has been refined through several iterations and a final segmentation process has been defined. Segmentation has been performed on 32 watersheds (40%). Draft NWI maps have been completed for 14 watersheds (17%) with another 15 watersheds currently in progress (18%). DU and the DNR participated in a two-day project workshop focused on improving hydro-geomorphic wetland classification.

**Project Status as of July 31, 2015:**

All data pre-processing has been completed by the DNR Resource Assessment Program and delivered to Ducks Unlimited. Ducks Unlimited has completed draft updated NWI data for 39 out of 80 watershed tiles. The DNR has switched over the online data review application from the southern MN project region to the northeastern MN project region and is ramping up data review efforts.

**Project Status as of January 31, 2016:**

Wetland mapping for the northeast regions continues to progress. Draft wetland data has been generated for 71 out of 80 watersheds (89% complete). The DNR has provided review comments for 23 watershed and the wetland maps have been finalized for these watersheds (29%). The anticipated completion date for the draft data is February 19, 2016 with all data being finalized by late March. Work continues on revising and finalizing the post-processing scripts for the simplified plant community classification and the simplified HGM classification.

**Overall Project Outcomes and Results**

Updating the National Wetland Inventory (NWI) is a key component of the State's strategy to ensure healthy wetlands and clean water for Minnesota. This effort is a multi-agency collaborative under leadership of the Minnesota Department of Natural Resources. These data are intended to replace the original 1980s NWI data. The NWI data provide a baseline for assessing the effectiveness of wetland policies and management actions. These data are used at all levels of government, as well as by private industry and non-profit organizations for wetland regulation and management, land use, conservation planning, environmental impact assessment, and natural resource inventories. The update project is being conducted in phases with data released for each region as it is finalized.

In this fourth phase of the overall effort, we provided updated wetland inventory maps for 14,700 square miles of northeastern Minnesota covering all of Lake, Cook, and St. Louis Counties and portions of Carlton and Koochiching Counties. With the completion of this phase, updated NWI data is now available for more than half of the state.

The updated NWI were mapped in accordance with federal wetland mapping guidance. This update used spring aerial imagery acquired in 2009, summer imagery acquired in 2013, and lidar elevation data as well as other ancillary data. Quality assurance of the data included visual inspection, automated checks for attribute validity and consistency, as well as a formal accuracy assessment based on an independent field data. Further details on

the methods employed can be found in the technical procedures document for this project located on the project website ([http://www.dnr.state.mn.us/eco/wetlands/nwi\\_proj.html](http://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html)).

**IV. PROJECT ACTIVITIES AND OUTCOMES:**

**ACTIVITY 1: Updated Wetland Maps for Northeastern Minnesota**

**Description:**

Produce updated wetland maps for 1,097 USGS quarter quadrangles of Lake, Cook, and St. Louis Counties in northeastern MN. The map production will be conducted by contractors under the supervision of the DNR and will be based on recommendations for wetland mapping methods developed by the UMN through a previous phase of this project. This work will consist of digital photo-interpretation, topographic analysis of LiDAR data, and analysis of ancillary data such as soils maps and forest inventory maps, as well as quality control review. Completed digital map data will be available to the public through several websites, including the DNR and the U.S. Fish and Wildlife Service.

**Summary Budget Information for Activity 1:**

**ENRTF Budget: \$1,000,000**

**Amount Spent: \$ 978,586**

**Balance: \$ 21,414**

**Activity Completion Date:**

<b>Outcome</b>	<b>Completion Date</b>	<b>Budget</b>
1. Updated wetland inventory maps for portions of Lake, Cook, and St. Louis Counties	4/30/16	\$1,000,000

**Activity Status as of January 31, 2014:**

The DNR published a request for proposals to conduct the update of the NWI for northeast Minnesota in July. The contractor selected for this work was Ducks Unlimited. Their bid came in under budget, allowing us to expand the scope of the mapping area from 7,185 square-miles to 13,778 square miles. Subsequently, we developed and executed a contract for this work on September 30, 2013. We also developed a service level agreement (SLA) with the DNR Resource Assessment Program (DNR-RAP) to provide project support including data preprocessing, field work, and quality control review.

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**Final Report August 2016:**

The final updated NWI data for the northeastern Minnesota project area was delivered to the DNR along with the metadata and a final version of the project technical procedures document. In addition to the 1,097 quarter quads (13,778 square miles) developed under this project phase, Ducks Unlimited also included updated NWI data for another 71 quarter quads (905 square miles) along the North Shore of Lake Superior that was developed with funding from the US Fish and Wildlife Service. The data for both areas was delivered as a single seamless GIS data layer. The data were reviewed and accepted by the DNR.

The overall wetland identification accuracy was 86% and the overall wetland classification accuracy was 69%. While the agreement with the validation data is not as strong as other regions, these results are much improved over the older NWI data for this region.

The DNR made a few formatting changes to the data and updated the metadata to ensure consistency with earlier phases of the project. Subsequently, the data were posted to the State's enterprise GIS system and have been made available more generally through the Minnesota Geospatial Commons (<https://gisdata.mn.gov/>) as well as through an online wetland viewer. The DNR also forwarded a copy of the data to the US Fish and Wildlife Service for inclusion in the national database for the NWI.

## **V. DISSEMINATION:**

**Description:** The plan for disseminating the project results primarily relies on distribution of the wetland maps through web-based data distribution hubs and online viewing of wetland maps through web mapping applications. Primary data access websites for the State of Minnesota include the [Minnesota Geospatial Commons](#). The primary online mapping application for viewing the data will be the [Minnesota NWI Mapper](#). Furthermore, the data are likely to be picked up and served by other sites and applications beyond the ones listed here. Publicity for this effort includes presentations at professional conferences as well as publication in selected newsletters and journals. Conference presentations will include at least two of the following venues; the Minnesota Water Resources Conference, the Minnesota GIS/LIS Conference, the Annual Minnesota Wetlands Conference, and the Conference of the Minnesota Association of Watershed Districts.

### **Status as of January 31, 2014:**

A short overview of the NWI project was given as part of a larger presentation on wetland monitoring and mapping at the DNR Round Table on January 10, 2014.

### **Status as of July 31, 2014:**

A stakeholder outreach meeting was held in Duluth, MN on February 6<sup>th</sup> to provide background information on the NWI update for northeastern Minnesota as well as to discuss opportunities for stakeholder participation. The DNR and DU made a joint presentation about the project through a webinar of the Wetland Mapping Consortium in April 2014. A recording of the presentation is available online (<http://www.aswm.org/wetland-science/wetlands-one-stop-mapping/3436-past-wetland-mapping-consortium>).

### **Status as of January 31, 2015:**

The DNR and DU collaborated on a peer-reviewed journal article describing the NWI project for the journal *Wetlands*. This paper has been accepted for publication and is currently *in press*.



**Status as of July 31, 2015:**

The DNR and DU paper has been published in the journal Wetlands.

Kloiber, S.M., Macleod, R.D., Smith, A.J., Knight, J.F., and Huberty, B.J. (2015) A semi-automated, multi-source data fusion update of a wetland inventory for east-central Minnesota, USA. *Wetlands*. 35(2):335-348.

In addition, a presentation on the project status and key milestones will be given to potential data users at the GIS/LIS conference this fall (October 8, 2015).

**Status as of January 31, 2016:**

Presentations on the NWI were provided to potential data users at both the GIS/LIS conference (Duluth) and the Minnesota Water Resources Conference (St. Paul). The presentations covered the overall project status of past, present, and future phases of the project as well as information on data availability and access.

**Final Report Summary:**

All wetland map data and aerial imagery are available free of charge to the public. The data have been made available through the Minnesota Geospatial Commons (<https://gisdata.mn.gov/>) as well as through an online wetland viewer (<http://www.dnr.state.mn.us/eco/wetlands/map.html>). A copy of the data has also been provided to the US Fish and Wildlife Service for inclusion in the national wetland database.

Use of the NWI data is being promoted through a variety of channels. The DNR has given presentations about the NWI data at both the Minnesota Water Resources Conference and the Minnesota GIS/LIS Conference. The DNR and MnGeo have presented at the Minnesota GIS/LIS Conference regarding the availability of the spring aerial imagery. A press release has also been drafted for an expected September release. A peer-reviewed journal article was published in the journal *Wetlands* based on the work from the previous NWI project phase and a book chapter has been prepared for an upcoming publication on wetland assessment.

**VI. PROJECT BUDGET SUMMARY:**

**A. ENRTF Budget:**

<b>Budget Category</b>	<b>\$ Amount</b>	<b>Explanation</b>
Personnel	\$157,000	Project manager at 0.65 FTE for 2-years.
Professional/Technical/Service Contracts:	\$756,650	One service level agreement with DNR Resource Assessment Office for data processing, field work, quality assurance, and other support, and one competitive bid contract for wetland mapping services.
DNR Direct & Necessary Support*	\$82,905	DNR's direct and necessary business services required to support this proposal
Equipment/Tools/Supplies:	\$445	Field supplies; GPS batteries, insect repellent, sunscreen, protective equipment, and paint for photo control points. Office supplies and

		equipment: printing, shipping, and digital storage media.
Travel Expenses in MN:	\$3,000	In-state mileage, lodging and travel expenses for project coordination, field reconnaissance, and outreach meetings.
<b>TOTAL ENRTF BUDGET:</b>	<b>\$1,000,000</b>	

\* Direct and Necessary expenses include both Department Support Services (Human Resources, IT, Financial Management, Communications, Procurement, and Facilities) and Division Support Services. Department Support Services are described in agency Service Level Agreements, and billed internally to divisions based on indices that have been developed for each area of service. Department leadership (Commissioner’s Office and Regional Directors) are not assessed. Division Support Services include costs associated with Division and regional leadership, business offices, and clerical support. Those elements of individual projects that put little or no demand on support services such as large single-source contracts, large land acquisitions, and funds that are passed-thru to other entities are not assessed Direct and Necessary costs for those activities.

**Explanation of Use of Classified Staff:** The DNR contracts for project management services for this project through MN.IT Services. The MN.IT project manager was originally hired as an unclassified DNR employee. This position was reorganized to MN.IT Services under a statewide consolidation of IT services and is now proposed to be changed to a classified employee. This position has been funded by the ENRTF program for 0.65 FTE. There is currently no other source of funding for managing the NWI project and once the project is complete the agency will secure other funds to continue funding this position.

**Explanation of Capital Expenditures Greater Than \$3,500:** NA

**Number of Full-time Equivalent (FTE) funded with this ENRTF appropriation:** 0.65 FTE for 2-years (1.3 FTE)

**Number of Full-time Equivalent (FTE) estimated to be funded through contracts with this ENRTF appropriation:** 7 FTE for two years (14 FTE)

**B. Other Funds:**

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
<b>Non-state</b>			
	\$0	\$0	
<b>State</b>			
	\$0	\$0	
<b>TOTAL OTHER FUNDS:</b>	<b>\$0</b>	<b>\$0</b>	

**VII. PROJECT STRATEGY:**

**A. Project Partners:** Partners providing in-kind services for this project include the Minnesota Department of Natural Resources, the Minnesota Pollution Control Agency, the Minnesota Board of Water and Soil Resources, the U.S. Fish and Wildlife Service, and the Minnesota Dept. of Administration’s Geographic Information Office.

**B. Project Impact and Long-term Strategy:** This is the fourth phase of a multi-phase project to update the NWI for the entire state of Minnesota. The estimated total budget for the project is \$7.5 million. With this appropriation, the total amount received from ENTRF to date will be \$4,150,000 (55% of the total estimated cost). Upon completion of this phase, our estimated progress will be approximately 75% completion for imagery and field data acquisition and approximately 47% completion for wetland mapping.

**C. Spending History:**

<b>Funding Source</b>	<b>M.L. 2008 or FY09-10</b>	<b>M.L. 2010 or FY11-12</b>	<b>M.L. 2011 or FY12-13</b>
ENTRF	\$550,000 Chap. 367, Sec. 2, Subd. 5a	\$1,100,000 Chap. 362, Sec. 2, Subd. 3b	\$1,500,000 First Special Session, Chp. 2, Art.3, Sec. 2, Subd. 03d
USGS/NGA	\$25,000		
St. Louis County	\$24,999		
MPCA Clean Water Legacy	\$111,000		
DNR – Heritage Enhancement Fund	\$ 181,064		
DNR/NOAA – Coastal Zone Program	\$ 24,227		
USGS/NGA	\$75,000		
Metropolitan Council	\$ 65,750		
Metropolitan Mosquito Control District	\$ 7,000		
McLeod County		\$24,000	
Sibley County		\$29,000	
Murray County		\$35,000	
US Fish and Wildlife Service		\$75,000	

**VIII. ACQUISITION/ RESTORATION LIST: N/A**

**IX. MAP(S): SEE MAP ATTACHMENT**

**X. RESEARCH ADDENDUM: N/A**

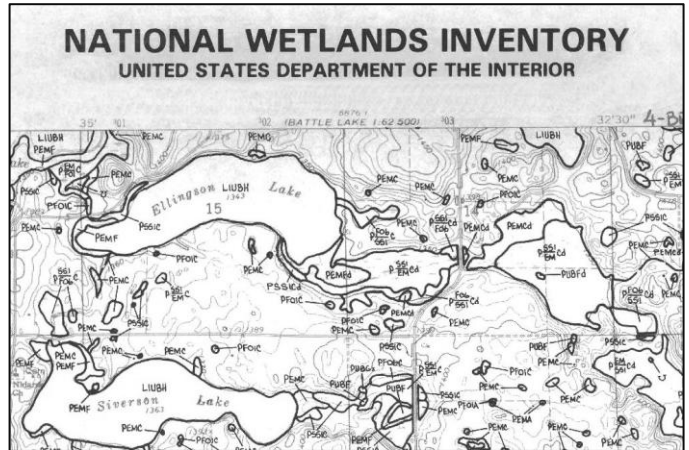
**IX. REPORTING REQUIREMENTS:**

**Periodic work plan status update reports will be submitted not later than January 31, 2014, July 31, 2014, January 31, 2015, July 31, 2015 and January 31, 2016. A final report and associated products will be submitted between June 30 and August 15, 2016 as requested by the LCCMR.**

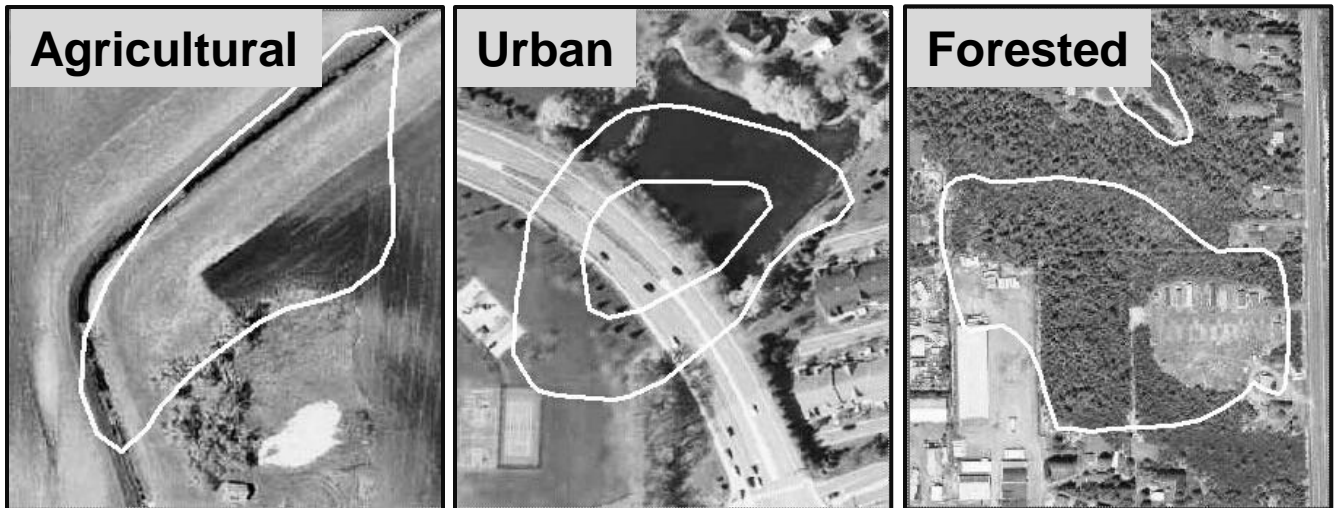
# The National Wetland Inventory Update for Minnesota

The NWI is being updated using modern, high-resolution digital imagery, digital elevation data from LiDAR, and the best-available ancillary GIS data including digital soil surveys and other aerial imagery.

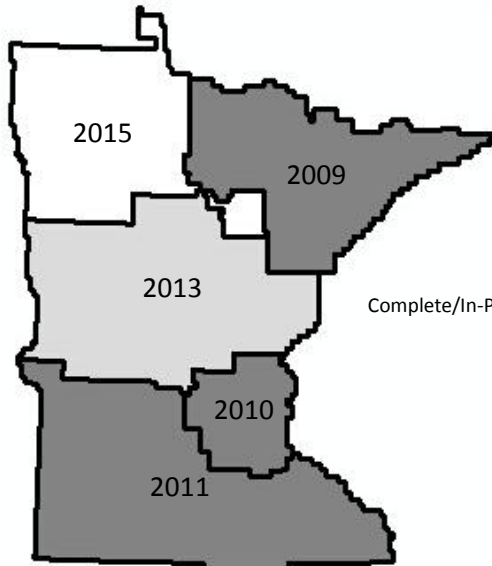
The original NWI maps for Minnesota were developed 25 to 30 years ago as paper maps.



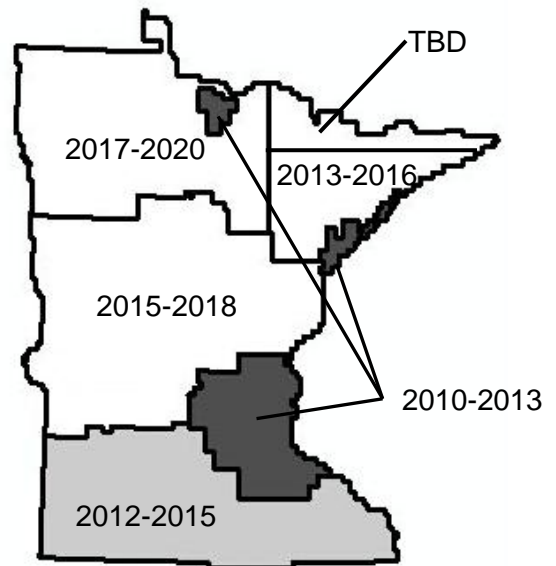
Examples of inaccuracies in the original NWI maps resulting from land use changes. The white outlines indicate wetlands from the original NWI superimposed on modern aerial photos.



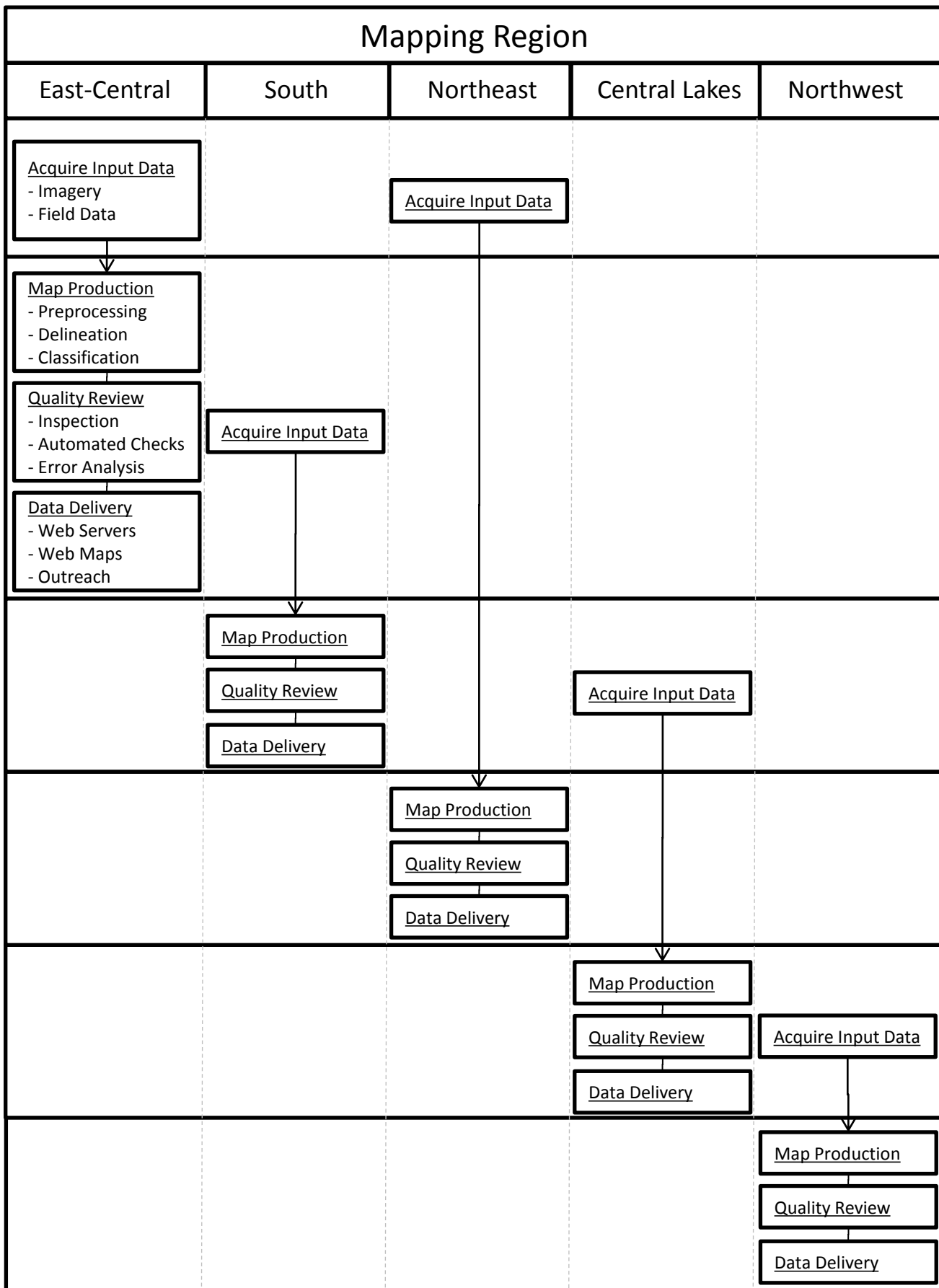
**Aerial Photography Status**



**Wetland Mapping Status**



# Schedule for the National Wetland Inventory Update



Attachment A: Budget Detail for M.L. 2013 Environment and Natural Resources Trust Fund Projects					
<b>Project Title:</b> <i>Updating the National Wetland Inventory for Minnesota - Phase 4</i>					
<b>Legal Citation:</b> <i>M.L. 2013, Chp. 52, Sec. 2, Subd. 03d</i>					
<b>Project Manager:</b> <i>Steve Kloiber</i>					
<b>M.L. 2013 ENRTF Appropriation:</b> \$ 1,000,000					
<b>Project Length and Completion Date:</b> Three Years - <i>June 30, 2016</i>					
<b>Date of Final Report:</b> <i>August 31, 2016</i>					
ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Activity 1 Budget	Amount Spent	Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	<i>Wetland Mapping</i>				
<b>Personnel (Wages &amp; Benefits)</b> <i>Project Manager (78% salary, 22% benefits); 0.65FTE for 2 years</i>	157,000	139,031	17,969	157,000	17,969
<b>Professional/Technical/Service Contracts</b> <i>Wetland Mapping Service - Ducks Unlimited</i>	663,200	663,200	0	663,200	0
<b>Professional/Technical/Service Contracts</b> <i>Service Level Agreement with DNR Resource Assessment Office for data processing and quality assurance support</i>	93,450	93,086	364	93,450	364
<b>DNR direct and necessary support</b>	82,905	82,905	0	82,905	0
<b>Equipment/Tools/Supplies</b> <i>Field supplies; GPS batteries, insect repellent, sunscreen, protective equipment, and paint for photo control points. Office supplies and equipment; printing, shipping, and digital storage media.</i>	445	0	445	445	445
<b>Travel expenses in Minnesota</b> <i>In-state mileage, lodging and travel expenses for project coordination, field reconnaissance, and outreach meetings.</i>	3,000	364	2,636	3,000	2,636
<b>COLUMN TOTAL</b>	<b>\$1,000,000</b>	<b>\$978,586</b>	<b>\$21,414</b>	<b>1,000,000</b>	<b>21,414</b>